



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/731,726 | 12/08/2000 | Kozo Shimizu | 001616 | 1555 |

7590

08/26/2003

ARMSTRONG, WESTERMAN, HATTORI
McLELAND & NAUGHTON
Suite 1000
1725 K Street, N.W.
Washington, DC 20006

EXAMINER

IP, SIKYIN

ART UNIT

PAPER NUMBER

1742

DATE MAILED: 08/26/2003

12

Please find below and/or attached an Office communication concerning this application or proceeding.



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF PATENTS
AND TRADEMARKS
Washington, D.C. 20231

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Paper No. 12

MAILED

AUG 26 2003

Serial Number: 09/731,726
Filing Date: 12-08-00
Appellant(s): Shimizu et al.

GROUP 1700

Daniel A. Geselowitz, Ph.D.
For Appellant

EXAMINER'S ANSWER

This is in response to the brief on appeal filed June 05, 2003.

(1) Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief. Therefore, it is presumed that there are none. The Board, however, may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

(3) Status of Claims

The statement of the status of the claims contained in the brief is correct.

This appeal involves claims 1-6, 15, and 16.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

The amendment after final rejection filed on March 06, 2003 to delete non-elected claims 7-14 has been entered.

(5) Summary of Invention

The summary of invention contained in the brief is correct.

(6) Issues

The appellant's statement of the issues in the brief is correct.

(7) Grouping of Claims

The rejection of claims 1-6, 15, and 16 stand or fall together because appellant's brief includes a statement that this grouping of claims stand or fall together.

(8) Claims Appealed

The copy of the appealed claims contained in the Appendix to the brief is correct.

(9) Prior Art of Record

The following is a listing of the prior art of record relied upon in the rejection of claims under appeal.

Serial No: 09/731,726
Art Unit: 1742

-3-

| Number | Name | Date |
|-----------|----------|---------|
| 6,160,224 | OGASHIWA | 12-2000 |
| 409260427 | AKAMATSU | 10-1997 |
| 4,690,725 | BULT | 09-1987 |

PL 115725, JP2000015476, and Arai et al., have been withdrawn as cumulative references.

(10) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and

potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-6 are rejected under 35 U.S.C. § 103 as being unpatentable over USP 6160224 to Ogashiwa et al in view of JP 409260427.

The Ogashiwa et al reference(s) disclose(s) the features including the claimed semiconductor structure and Sn-Ag solder bump. The features relied upon described above can be found in the reference(s) at abstract. The difference between the reference(s) and the claims are as follows: Ogashiwa et al does not disclose the alpha ray in Sn. However, JP 409260427 in abstract and Table 1 in col. 7 disclose(s) alpha ray could be reduced from a solder bump in the same field of endeavor or the analogous metallurgical art. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to reduce alpha rays from a solder bump as taught by JP 409260427 in order to eliminate soft error inversion ratio of semiconductor device. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claims 1-6 above, and further in view of USP 4690725 to Bult et al.

The claimed subject matter as is disclosed and rejected above by the cited reference except for preparing Sn alloy by a zone-melt method. However, Bult in col. 1, line 65 to col. 2, line 6 teaches zone refining/melting of Sn in the same field of endeavor or the analogous metallurgical art to purify Sn. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to purify Sn with zone refining as taught by Bult in order to improve Sn purity. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

(11) Response to Argument

Appellant's arguments filed June 05, 2003 have been fully considered but they are not persuasive.

Appellants argue in first full paragraph in page 6 and paragraph bridging pages 7-8 of instant brief that none of the examples in Ogashiwa and JP 409260427 disclose the claimed Ag range. However, it is well settled that the examples of the cited reference are given by way of illustration and not by way of limitation. In re Boe, 148 USPQ 507 (CCPA 1966) and In re Snow, 176 USPQ 328.

Appellants argue that the α -rays disclose in JP 409260427 are " <0.1 cph/cm²" which is much higher than the claimed " ≤ 0.01

cph/cm²". But, the claimed α -rays are overlapped by α -rays of cited reference.

Appellants' argument in page 8, first full paragraph of the instant brief is noted. But, it is found inconsistent with the instant transitional expression "having" which includes unrecited ingredients in major amounts other than Ag and Sn.

Appellants' argument as set forth in paragraph bridging pages 8-9 of the instant brief is noted. But, appellants fail to show the overlapped ranges have different properties; thus, as stated in In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976), "the disclosure in the prior art of any value within a claimed range is an anticipation of that range."

Appellants argue that the alloy of Ogashiwa contains Pb as optional element. But, Pb is not an essential element in the alloy of Ogashiwa. Furthermore, it is well settled that omission of an element and its function where not needed is obvious. Ex parte Rainu, 168 USPQ 375 (PTO Bd. of App. 1969) and In re Karlson, 136 USPQ 184 (CCPA 1963).

Appellants argue in paragraph bridging pages 10-11 of the instant brief that Akamatsu has no suggestion or motivation for the claimed ≤ 0.01 cph/cm². But, as matter of fact that both Akamatsu's range "<0.1 cph/cm²" and claimed range " ≤ 0.01 cph/cm²" have same lower limit - zero.

Appellants' argument as set forth in page 11, item 2 of the instant brief is noted. But, the instant transitional expression "having" in claim 1, for example, does not exclude any element from cited references. Moreover, the claimed elements' contents are overlapped by the elements' content as recited in cited references.

Appellants argue that Ogashiwa is silent about the α -ray. But, the claimed α -ray reads on zero which suggests said ray needs not be disclosed by reference.

Appellants argue the first time that page 7, lines 6-14 and page 7, line 25 to page 8, line 12 of the instant specification show unexpected result. But, the instant transitional expression "having" does not exclude Ni, Au, Cu, and the like elements. And the claimed Sn content is met by Ogashiwa. Moreover, the Ag range from 0 to less than 1.5 wt.% in Figure 3 has the same property as the claimed range, which shows the claimed Ag range is not critical from end-point to end-point. The properties in Tables 1 and 2 of the instant specification are mixed. The benefit of the claimed combination cannot be seen. Comparison must be done under identical condition except for the novel features of the invention. In re Brown, 173 USPQ 685 and In re Chapman, 148 USPQ 711. The showing of unexpected results must be occurred over the entire claimed range. In re Clemens, 622 F.2d

Serial No: 09/731,726
Art Unit: 1742

-8-

1029, 206 USPQ 289, 296 (CCPA 1980). The scope of the showing must be commensurate with the scope of the claims. In re Tiffin, 448 F.2d 791, 792 (Fed. Cir. 1971), In re Coleman, 205 USPQ 1172, In re Grasselli, 713 F.2d 731, 743, 218 USPQ 769, 778 (Fed. Cir. 1983), and In re Greenfield, 197 USPQ 227.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

S. Ip


SIKYIN IP
PRIMARY EXAMINER

August 22, 2003

Conferees


ROY KING
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Roy V. King, SPE

Robert Walden, SPE

Serial No: 09/731,726
Art Unit: 1742

-9-

Daniel A. Geselowitz, Ph.D.

Suite 1000

1725 K Street, N.W.

Washington, D.C. 20006